

GammaSAG Summary

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on behalf of the GammaSAG
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What is GammaSAG?

The goal of the Gamma Ray Science Analysis Group (GammaSAG) is to provide quantitative metrics and assessments to NASA in regard to current and future needs of the gamma-ray astrophysics community. Specifically, the GammaSAG will

- Act as a **focal point and forum** for the gamma ray community.
- In 2012–2013, produce a **white paper** covering the techniques used in each gamma-ray band—Compton telescopes in medium energy and pair conversion telescopes in high energy—and both balloon and satellite platforms.
- Produce a list of **technology development needs** based on the white paper discussions, including a roadmap for those activities.
- Produce suggestions to help **support the specific needs of this unique community**: organizational, scientific, funding.

First Meeting!

Agenda included

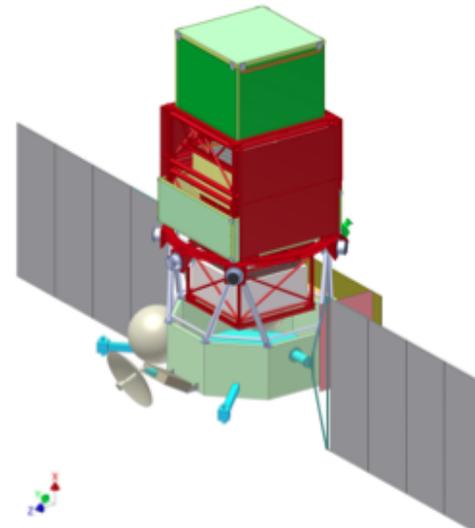
- Status of current gamma-ray missions
- Reports on new technology development
- Discussions of science and technology content for the white paper

What is a gamma ray?

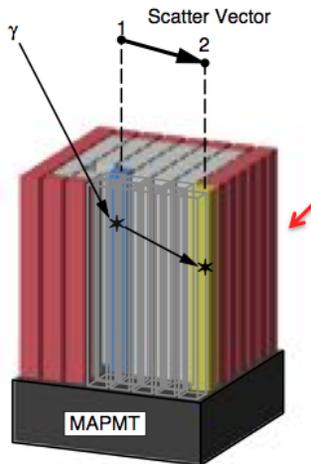
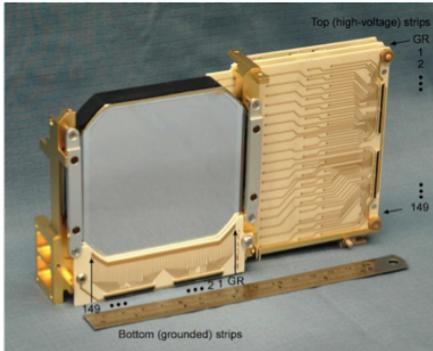
- Where does the XRSAG end and the GammaSAG begin?
 - Focusing not feasible above ~80 keV
 - Compton interaction becomes dominant from 60-100 keV
 - Study of 511 keV emission begins around 300 keV
 - Interesting science for the gamma-ray group below 511 keV, e.g., gamma-ray bursts, titanium 44 lines
- General consensus to go to 100 keV, but this should be adaptable to accommodate science cases that are best emphasized one place or the other
 - Need coordination with XRSAG

News from the Community

- Reports
 - Swift status (Neil Gehrels)
 - Fermi status (Julie McEnery)
 - Status of Gamma-400, pair-production gamma-ray satellite planned by Russia (Alex Moiseev)
 - Design freeze in 2013
 - Launch in 2018/19

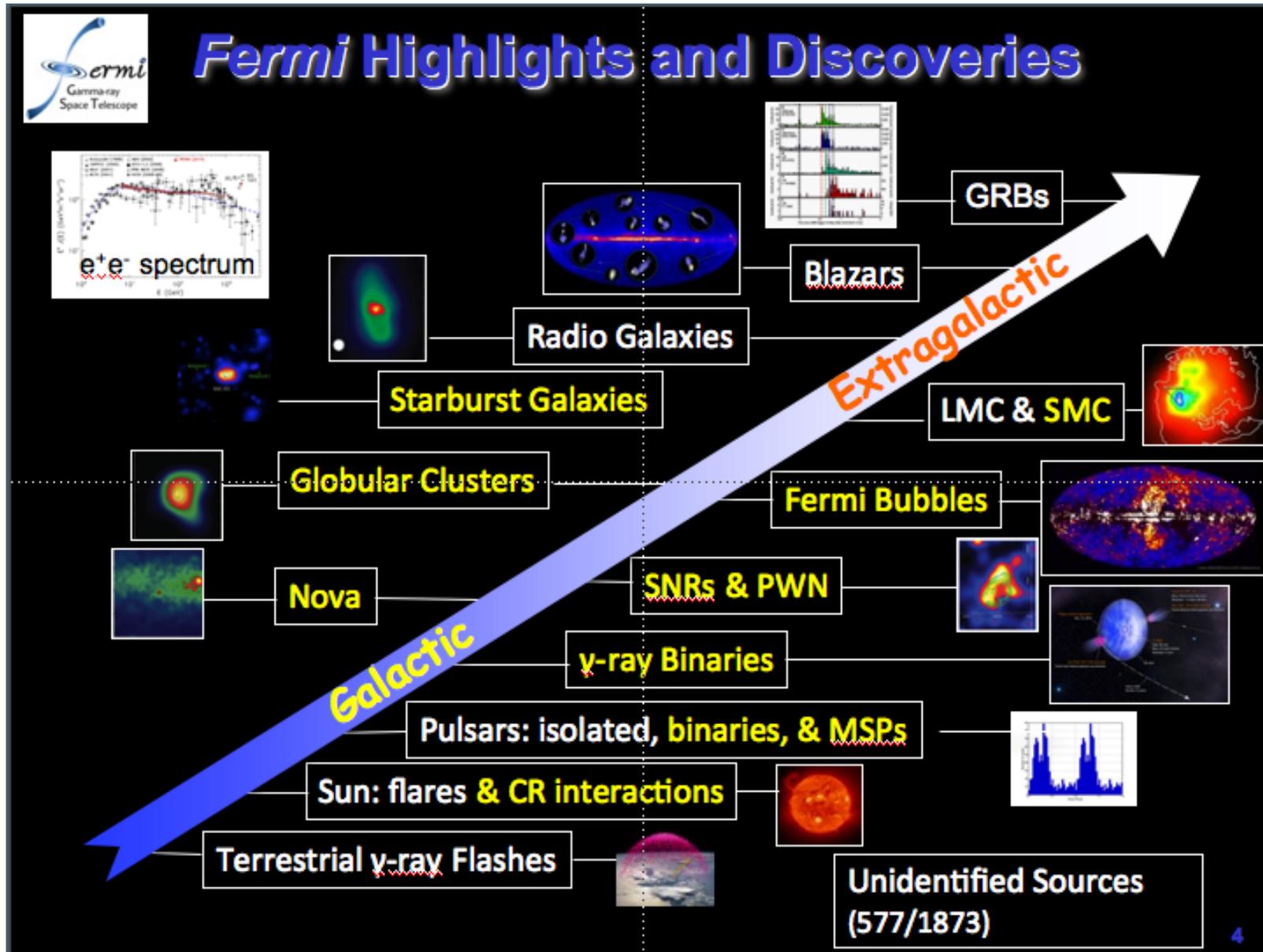


Compton Telescope Technology



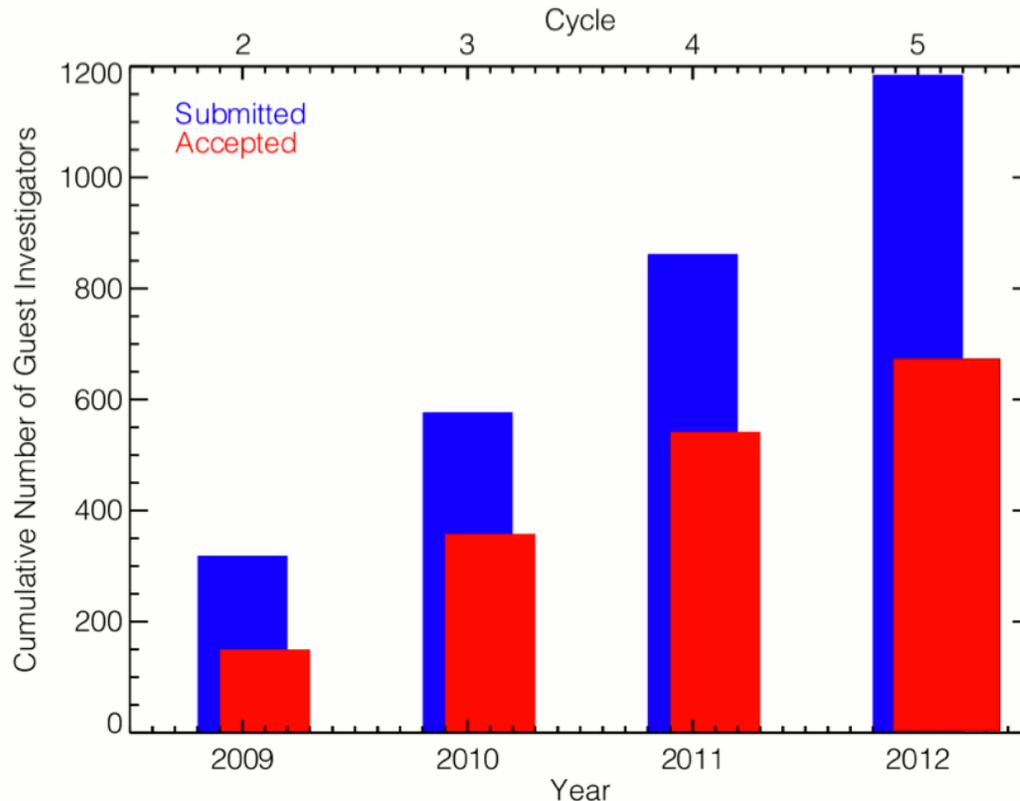
- Nuclear Compton Telescope upgrade for 2014/15 balloon flight. Goal to map the 511 keV positron annihilation line. (Steve Boggs)
- 2011 balloon flight carried a scintillator Compton polarization instrument (50-500 keV). Also carried a fast scintillator (LaBr_3) telescope and test SiPM. (Mark McConnell, Peter Bloser)
- Both of above designing for ultra-long duration balloons
- Silicon Compton detector development at NRL (Eric Wulf)
 - Simplify configurations and improve power requirements

Gamma-ray science is growing



The Gamma-Ray Community is Growing!

From Julie McEnergy's Fermi update



Note: These represent US Fermi users only

- ***Fermi* is a young mission!**
 - The community of Fermi users is growing by 10-20% per year
 - Analysis gets more complex and difficult with time
 - User support workload continues to grow

“...we have yet to see the peak of *Fermi*'s science output” -- 2012 Senior Review
New for cycle 6 – adding VERITAS observations opportunity to GI program

PhysPAG, August 16, 2012

White Paper Planning

- Starting with white papers submitted to decadal survey and recent concept studies
- Goals
 - Define key science objectives to be addressed by gamma-ray observations
 - Connect these to decadal survey priorities
 - Describe current technological capabilities and assess development needs
 - Map technologies to science goals
 - Consider how technology and science capability scales with mission size

White Paper Planning

- Current work is compiling resources and developing list of science objectives
- Next meeting in September